

UNIVERSITY OF CALIFORNIA.

AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 76.

Distribution of Seeds and Plants.

The distribution of seeds and plants from the University Experiment Station is each year commanding wider attention. The distribution, last year, as shown in detail in Bulletin No. 68, included shipments to upward of 630 individuals, and the geographical area covered is indicated by the fact that the material was sent into nearly all the counties of California, and to more than 600 post and express offices.

It will be noticed that we offer this year a greater number than ever before of growths received by us from the Department of Agriculture at Washington. Many of the seeds from this source have given much promise by their success in the University garden, and by our system of distribution we believe we can more readily transmit them to those who are disposed to test them carefully and intelligently than can be reached by the usual method of political dissemination. Hon. N. J. Colman, U. S. Commissioner of Agriculture, in his report to the present Congress, advises that future seed distribution be through the agency of the State Experiment Stations, and we believe such an arrangement will be productive of the best results. We have labored hitherto, in anticipation of a closer relationship with the U. S. Agricultural Department, to show what can be done to promote local experimentation under local guidance, and it is expected that when the new law establishing Experiment Stations shall be made effective by the appropriation of funds to carry out its provisions, the work of introduction and distribution of promising seeds and plants will be greatly facilitated and advanced.

As has been described in previous bulletins, this distribution is made for the purpose of ascertaining the adaptation and practical value of the several kinds in the different climates and soils of the State; and persons receiving them are requested to report results, whether success or failure, and if the latter, from what apparent causes.

Terms.—As there is no appropriation available to meet the expenses of packing and postage, applicants are requested to send the amounts specified in connection with each description below. If they desire seeds sent by express, applicants need not send the amounts specified for postage, but all orders for seeds by express must be accompanied by a remittance of ten cents to pay for packing. Applications may be made for one or more kinds of seeds. In case any kind of seed becomes exhausted, the money sent will be returned unless a second choice is mentioned by the sender.

Plants will be forwarded by express (unless specially otherwise requested), in lots consisting of the number hereinafter mentioned for each kind, on remittance of 25 cents for each lot of plants, and ten cents additional for each additional lot, to pay expenses of packing, etc. Postal notes are requested to be sent in lieu of stamps whenever practicable. Any surplus left after filling orders as far as possible will be returned to the senders, deducting letter postage.

Cereals.

Hessian Fly-Proof Wheats.—The repetition this season of our experiments with resistance of wheat varieties to attacks of the Hessian fly (*Cecidomyia destructor*) affirms the value of the kinds distributed last year, and leads us to urge them for trial in infested districts. The Missoyen wheat on our poor soil and with the deficient rainfall of 1887 yielded at the rate of 33 bushels to the acre, while other non-resistant wheats adjacent were killed outright or reduced to a fraction of a crop by the fly. The Atlanti wheat yielded over 27 bushels, and the Volo at the rate of 20 bushels per acre. These varieties are solid-stemmed and were originally dark, hard wheats, but are fast becoming white and starchy, but do not so far sacrifice their resisting qualities. Applicants will be furnished with one pound of each of the three varieties [(1) Missoyen, (2) Atlanti, (3) Volo], or a single pound of each variety. Send 20 cents for each pound ordered, if to be sent by mail.

Indian Corn.—A collection of maize received from the U. S. Department of Agriculture included some varieties which did very well even under the local conditions of Berkeley, which are not at all suited to this grain. We distribute them to be tested in other localities, where the summer heat is usually too low for corn, as well as in the best corn districts of the State. The varieties are as follows: The soil requirements mentioned are given on Mexican authority.

1. Mosby's Improved Prolific.
2. Fine Pigeon Corn (Mexican)—for sandy soils.
3. Cacahuazintle (Mexican pastry corn) for poor soil.
4. Chalco (Mexican 90-day corn).
5. Lezma (Early Mexican Yellow) for poor soils.
6. Early Black, for poor soil.
7. Early Minnesota Sweet; dwarf sort; fine.
8. Early Sugar; dwarf sort; fine.

Seed of these varieties will be sent, as long as the supply lasts, in 3-oz. packets of each variety at 5c. each. Applicants may order one or more kinds.

Berkeley Hybrid Barley.—A two-rowed, beardless variety, which originated in a small plat of Scotch two-rowed barley on the University grounds in 1882, when Mr. W. G. Klee, then head gardener, found two heads of what he considers the true type, viz.: two-rowed and slender ears, appendices to awns three-cleft, as with the Nepal barley; hull adhering to the seed. All the kernels of these two heads were sown next season in the University garden. There was found considerable tendency to variation, probably 12 per cent being untrue to type in having beards or six rowed heads. The grain has been grown each year since that time and care taken to pull out all heads not true to type before blooming. Afterward all heads were picked over and all grain shelling out was rejected. The tendency to variation has decreased from year to year, but still exists to a certain extent. We propose to continue the selection of true heads in our sowing here, and would like to have the variety tested by barley-growers, for yield, quality and hardiness. We imagine it will be found of chief value as a hay grain. Seed will be sent by mail in 1-lb. bags, 20c. each.

Oats.—A large sowing of oat varieties was made in 1887, partly because the oat does not harbor the Hessian fly, and also with the object of testing the rust-resisting power of the varieties. It did not prove a "rusty year," so no data on that point were gained. The following varieties gave the best yield on the Experimental Grounds this season, and are offered for test in the oat districts of the State:

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| 1—Black Tartar | 5—Hopeton |
| 2—Canadian | 6—Early Black (Etampes) |
| 3—Hallet's Pedigree | 7—Harris (from Alabama) |
| 4—Polish | 8—Late Silesian. |

Applicants will be furnished with one pound of each variety, or of either variety; send 20c. for each pound ordered.

Trees and Shrubs.

The Camphor (*Cinnamomum camphora*).—In many parts of California this tree has proved a hardy and a rapid grower. It is a very handsome evergreen, and likely to prove valuable in this State, both as a source of gum camphor and for timber; also very satisfactory as an ornamental or shade tree. Trees planted late last spring on the dry hill east of the University site survived the unusually dry summer. Squirrels seem to have no use for the camphorated foliage. A fine lot of seedlings were donated by A. Chabot, Esq., of Oakland, and will be sent in lots of five to each applicant; 25c. for each lot.

Cork Oak (*Quercus suber*).—Seedlings from acorns obtained from trees about 30 years old in Los Angeles and Calaveras counties. There are now bearing cork oaks in at least five counties of the State. The failing supply abroad and the immense prospective demand for cork in this country make it a duty to plant cork oaks for the use of the coming generation. It seems a very promising investment, too, for

future benefits. Small trees, two to each lot, 25c. per lot by express.

The Strawberry Tree (*Arbutus Unedo*).—The true madrone of Spain: A near relative of our native madrone (*Arbutus Menziesii*). The strawberry tree is an ornament to any garden, while its sweet berry, very much resembling in appearance and taste the strawberry, might make it profitable fruit. Our stock is small: One tree to each lot; 25 cts. per lot by express.

Kikar (*Acacia Arabica*).—The true gum arabic tree, seed of which we obtained from the Department of Agriculture, Cawnpore, India. Will not stand frost and is only fit to plant in thermal belts. We have but a small stock and will send only where evidence of a frostless situation can be given. Four trees to each lot; 25 cts. per lot by express.

Black Wattle (*Acacia decurrens*).—We have saved a good lot of seed of this promising tree and desire to secure its general introduction. The seed is small and a 2-oz. packet properly handled should give trees for a large plantation: Five cents per packet by mail. In some cases a large amount of seed will be furnished.

Guavas.—We have a few plants of the strawberry guava (*Psidium cattleianum*) a hardy species. Two plants to each lot; 25c. per lot by express.

Date Palms.—A small number of seedling date palms from seed produced by the late E. Von Borstel of Lower California will be sent to localities where the conditions seem to favor the plant. It is possible some of these seedlings may prove especially adapted to California. Mr. Von Borstel succeeded in securing early ripening varieties and furnished us seed from them. We wish to place the trees in careful hands. Two plants to each; 25c. per lot by express.

Melon Tree (*Carica papaya*).—Plants grown from seed of a fruit procured from Mexico by G. P. Rixford. The growth and fruiting of this tree in San Diego (as described in our last annual report, page 116) and elsewhere in frostless situations in this State commend it for trial in strictly thermal belts to determine how far it will prove hardy. It is highly ornamental in form and in bloom and its fruit very desirable. We have but a small stock and reserve the right to place them only in what seems to us promising situations. Two plants in each lot; 25c. per lot by express.

Silician Sumac (*Rhus coriaria*).—This is the true tanners' sumac of which large importations are made from the Mediterranean region. Our plants have matured seed this year. We will send seed, 2c. per packet; or rooted plants, two to each lot; 25c. per lot by express.

The Tea Plant.—Seedlings grown from Japanese seed and donated by A. Chabot, Esq., of Oakland. Tea plants thrive in many parts of California, and in some cases the leaves are gathered for home use. We can furnish a limited number in lots of three plants each; 25c. per lot by express.

Grasses and Forage Plants.

Schrader's Brome Grass (Bromus unioloides).

—This grass is fully discussed in our last annual report. It is proving valuable in many situations and should have farther introduction in new localities. Seed in 3-cz. packets; 5c. each by mail.

Hungarian Brome Grass (Bromus inermis).—Also a promising grass deserving wider trial. Seed in 3-cz. packets; 5c. each by mail.

Many-Flowered Millet Grass (Miliun multiflorum).—Our correspondents speak very highly of this grass and others should try it. It seems best adapted to the warmer parts of the State. Seed is very small; 1-cz. packets; 2c. each by mail.

Yellow Millo Maize.—This is a variety of sorghum. The seed is donated for distribution by E. A. Bonine of Lamanda Park, Los Angeles county. Mr. Bonine has tried this variety in comparison with "white millo-maize" and with "Kaffir corn," and considers it much superior to either in yield of seed and fodder.

Snail Clover (Medicago turbinata).—An annual starting in to grow early, making a dense growth and covering the ground thickly with pods twice the size of burr-clover pods and smooth, so that they will not cling to the wool of sheep. Preliminary trials indicate considerable value. Seed in 3-oz. packets; 5c. each by mail.

Black Medic (Medicago lupulina). The growth of this plant without water, in the University garden, and in other situations where it has taken root, commends it highly for wider trial. It is a persistent grower, and makes a deep and dense mat of foliage. Seed in 1-cz. packets; 2c. each by mail.

Tagasaste (Cytisus proliferus albus).—This is a leguminous shrub from the Canary islands, where it furnishes much pasturage on dry hill-sides. In the University garden it has grown to 10 feet in height, and is apparently overgrown under too kind conditions, though it has had no water. It should be tried on dry hill-sides, where it may prove more nearly what Baron Von Mueller describes it, "a tall herb, recommended as a fodder plant in countries exposed to drouth." We would especially like to have it tried on sheep and goat ranges. Pour hot water on seed and let stand 12 hours before planting. Seed in 1-oz. packets; 2c. each by mail.

Salt Bushes (Atriplex sp.).—Our last report (p. 93) contains quite contradictory reports as to the value of these plants, which are especially recommended for saline soils. They are found to be of great value in Australia in such situations, and some California growers speak well of them. We have a good lot of rooted plants, which we send in lots of 5 each; 25c. per lot by express.

Fiber Plants.

We offer again the fiber plants of which quite a number were sent out last year:

New Zealand Flax (Phormium tenax).—Grows well in the coast regions of the State. Valuable for tying plants, vines, etc. Five plants to the lot; 25c. per lot by express.

Esparto Grass (Stipa tenacissima).—Grows well on sandy beaches within reach of salt water, and in some other situations. Used for cordage, basket-weaving and paper-making. Ten plants to the lot; 25c. per lot by express.

Ramie (Boehmeria candiana).—The famous "China grass." Several processes are now being advocated as successful in extracting the fiber, and some foresee an important industry resulting therefrom. Ten plants to the lot; 25c. per lot by express.

Fiber Flaxes.—Four varieties of *Linum usitatissimum*: grown in Europe especially for fiber; reach twice or thrice the height of the kind commonly grown for seed. Seed of one or more varieties in one-pound sacks; 20c. each by mail.

Grapes: Roots and Cuttings.

The Wild Arizona Vine (Vitis Arizonica).—To those residing in regions already infested and wishing to test this resistant stock in new situations we will send rooted vines thoroughly disinfected. Five to each lot; 25c. per lot by express.

Huasco.—The raising grape from Chile. Though the value of this variety as compared with the Muscat is not fully established, it appears that in some situations it is especially good. Cuttings by mail 15c. per bundle of 12.

Asiatic Vines.—The peculiar appearance of these vines (*Vitis Romaneti* and *Spino vitis Davidii*) and the interest which pertains to their undetermined value in this State makes them desirable to amateurs and experimenters. Cuttings by mail, 15c. per bundle of 12.

Miscellaneous.

Chick-pea (Cicer arietinum).—This is a variety of the species which is so highly esteemed in France and other countries of Southern Europe for the same purpose as the lentil. It is the basis of the *puree aux croutons*, so popular in Paris. Cultivated like other peas, the pods being gathered before the seeds are perfectly ripe. Sent in 1 oz. packets; 2c. each.

Chuna.—Another variety of chick-pea brought from East India in 1886 by Miss Luella Kelly and donated to the University by R. E. Wood of St. Helena. It is a brown seeded variety. The seeds are eaten by the natives in curries, cakes, etc., and are also very fattening for cattle. Sent in 1-oz. packets; 2c. each.

Quinoa (Chenopodium quinoa).—The seed of this plant has been offered to California experimenters for several years, but does not attract much attention. The plant is highly esteemed in Peru and is favorably mentioned by travelers. The seed is used for food, being prepared for the table as beans are. It is also possible that it would be of value for poultry and stock. It should have a wider trial. Sent in 1 oz. packets, 2c. each.

Buckwheat.—We have two varieties from the Orient, one called "Asiatic," the other "Chinese." They differ from the common variety in having a very long growing and blooming season, which may render them of special value to beekeepers to provide winter stores for the bees, even if the honey is too dark for sale. In yield of grain they are probably no better than the common kind. Sent in 1-oz. packets, 2c. each.

Pumpkins and Squashes.—Seed of the following varieties was received from the Department of Agriculture: (1) Pumpkin Cushaw; (2) Mammoth Tours; (3) Calabaza, a Mexican variety of pumpkin squash; (4) Cushaw squash. These varieties grown on the University grounds seem to commend themselves for trial over a wider area. Seed of each or all kinds in 1-oz. packets; 2c. each by mail.

Bamboos—A limited number of applicants can be supplied with bamboo plants of two species: (1) the Ringal (*Arundinaria falcata*), a small cane species, very ornamental for a large lawn; (2) the *Metake*, medium-sized canes. Our larger cane species are not available for distribution. So far as the stock goes, we will send one plant of each kind in each lot; 25c. per lot by express.

Tobacco.—We have grown the past season a fine collection of tobacco varieties of which seed was received from Washington. Although the industrial value of the plant in California must still be regarded as undetermined, because of the failure of curing processes, the seed is offered to any who are disposed to grow the plant for experiment or for use as an insecticide. We have 20 named varieties, of which we will send seed by mail in small packets at

2c. each variety.

Insect Powder Plants (*Pyrethrum cinerariifolium* and *roseum*). The former has the stronger insecticide properties; the latter beautiful flowers. Seed of the former in 3-oz. papers, 5c.; the latter in small packets, 2c. each.

Fruit-Tree Scions.

The University orchard contains upward of 500 named varieties of fruit, and our report of 1886 contains, on pages 130 to 140, tables in which are succinctly recorded observations on apricots, apples and pears, growth of tree and quality of fruit, time of ripening, keeping quality, etc. These observations cover a series of years and indicate that some varieties are worth a trial in other parts of the State. Applicants may order any of the varieties named in the report. We do not furnish rooted trees but scions for grafting. We do not send large quantities of any variety, because the object is to test varieties and not to furnish material for commercial propagation. Send 10c. for each dozen ordered.

N. B.—All applications for seeds and plants should be made as early as possible. We expect to send out seeds about January 1st and plants about February 1st. All applications should be addressed to E. W. HILGARD
December 10, 1887. Berkeley, Cal.